26/5/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

6668628 INSPEC Abstract Number: B2000-09-6250G-014
Title: Key technology trends - satellite systems
Author(s): Bostian, C.W.; Brandon, W.T.; MacRae, A.U.; Mahle, C.E.; Townes, A.
Author Affiliation: Center for Wireless Telecommun., Virginia Tech., Blacksburg, VA, USA
Journal: Space Communications vol.16, no.2-3 p.97-124
Publisher: IOS Press,
Publication Date: 2000 Country of Publication: Netherlands
CODEN: SPCCEJ ISSN: 0924-8625
SICI: 0924-8625(2000)16:2/3L.97:TTSS;1-7
Material Identity Number: N535-2000-003
U.S. Copyright Clearance Center Code: 0924-8625/2000/$8.00
Language: English Document Type: Journal Paper (JP)
Treatment: General, Review (G)
Abstract: This paper is based on material extracted from the WTEC Panel Report Global Satellite Communications Technology and Systems, December 1998. It presents an overview of key technology trends in communications satellites in the last few years. After the introduction which deals with such issues as the transformation of the one-at-a-time approach for building satellites to a production-oriented one, there follows a discussion of critical technologies for large geosynchronous Earth orbit (GEO) satellites with power systems growing to 20 kW and more. Satellite antenna technology, one of the most critical areas in measuring progress, is next reviewed, including large reflector **antennas , phased arrays** and optical beamformers. This is followed by a discussion of onboard processing (analog and digital), progress in satellite traveling wave tubes, solid state power amplifiers and optical satellite technologies including intersatellite links (ISL). Lastly some pertinent satellite bus issues (electric propulsion, thermal control and attitude control) are reviewed. Small and mini-satellites are discussed, but not treated in great detail as much of their technology is derived from that of GEO satellites. (8 Refs)
Subfile: B
Descriptors: antenna phased arrays; attitude control; optical links; power amplifiers; power systems; reflector antennas; satellite antennas; satellite communication; signal processing; technological forecasting; travelling wave tubes
Identifiers: technology trends; satellite systems; WTEC Panel Report; Global Satellite Communications Technology and Systems; communications satellites; geosynchronous Earth orbit; GEO satellites; power systems; satellite antenna technology; large reflector antennas; phased arrays; optical beamformers; onboard analog processing; onboard digital processing; satellite traveling wave tubes; solid state power amplifiers; optical satellite technologies; intersatellite links; ISL; satellite bus; electric propulsion; thermal control; attitude control; mini-satellites
Class Codes: B6250G (Satellite communication systems)

26/5/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

5970284 INSPEC Abstract Number: B9808-6250G-026
Title: Deployment of the S-band phased array antenna on ETS-VI
Author(s): Matsumoto, Y.; Kohata, H.
Journal: Review of the Communications Research Laboratory vol.43, no.3 p.383-90
Publisher: Minist. Post Telecommun,
Publication Date: Sept. 1997 Country of Publication: Japan
CODEN: TSKKED ISSN: 0914-9279
SICI: 0914-9279(199709)43:3L.383:DBPA;1-X

Material Identity Number: M745-98001
Language: Japanese Document Type: Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: The results of in-orbit deployment of the S-band **phased array** (SIC) **antenna** on ETS-VI is presented. The deployment of a satellite antenna in orbit is a critical operation because its failure results directly in the loss of all of the communications missions that use the antenna. The antenna panel on which radiation elements were mounted was attached to a tower structure during the launch phase and then released by pyrotechnics in orbit. Then the antenna panel was deployed on hinges by means of a stepping motor and rack and pinion gears. The hinge temperature was maintained carefully, because stiffness of the feeding coaxial cables integrated with the hinge structures influences deployment, especially at low temperature. The operational procedure of the deployment included contingency operations due to hypothetical overheat of the drive motor or misfire of the pyrotechnics. Throughout the deployment procedure, the acceleration of the antenna panel was sensed and the data was transmitted to the ground in real time to monitor deployment behavior. Static images of the deploying antenna taken by onboard CCD cameras were also transmitted. This paper describes the operations from the launch to the deployment, the mechanical characteristics of the deployment,and the thermal conditions of the antenna before and after deployment. The deployment was completed successfully and the measured characteristics were found to agree well with the results of the ground tests. (9 Refs)
Subfile: B
Descriptors: acceleration measurement; antenna feeds; antenna phased arrays; antenna testing; microwave antenna arrays; satellite antennas; temperature measurement
Identifiers: S-band phased array antenna; ETS-VI; satellite antenna; radiation elements; antenna panel; pyrotechnics; stepping motor; rack and pinion gears; hinge temperature; feeding coaxial cables; contingency operations; acceleration sensing; image transmission; CCD cameras; thermal conditions; antenna tests
Class Codes: B6250G (Satellite relay systems); B5270D (Antenna arrays); B5270F (Antenna accessories); B7320R (Thermal variables measurement)

26/5/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

5629650 INSPEC Abstract Number: B9708-2575-026, C9708-3360L-061
Title: Microwave and mechanical considerations in the design of MEM switches for aerospace applications
Author(s): De Los Santos, H.J.; Yu-Hua Kao; Caigoy, A.L.; Ditmars, E.D.
Author Affiliation: Hughes Space & Commun. Co., Los Angeles, CA, USA
Conference Title: 1997 IEEE Aerospace Conference. Proceedings (Cat. No.97CH36020) Part vol.3 p.235-54 vol.3
Publisher: IEEE, New York, NY, USA
Publication Date: 1997 Country of Publication: USA 4 vol. (xxiv+405+567+637+515) pp.
ISBN: 0 7803 3741 7 Material Identity Number: XX97-00518
U.S. Copyright Clearance Center Code: 0 7803 3741 7/97/$5.00
Conference Title: 1997 IEEE Aerospace Conference
Conference Sponsor: IEEE Aerosp. & Electron. Syst. Soc
Conference Date: 1-8 Feb. 1997 Conference Location: Snowmass at Aspen, CO, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Practical (P)
Abstract: Microelectromechanical Systems (MEMS) technology is expected to have tremendous impact on aerospace systems. Indeed, **phased array antennas** , frequency multiplexers, spacecraft GN&C, on-board communications, autonomous health monitoring and safety, space structures, thermal control, and on-board system reconfigurability will favorably and decisively impacted MEMS technology. One of the most fundamental and ubiquitous components in these functions, enabled by MEMS technology, will be the electrostatic microelectromechanical (MEM) switch. The MEM switch,

due to its simplicity and high performance potential, is poised to become the pioneering MEMS component, particularly, for microwave signal processing-related applications in space-based communications systems. This paper will discuss the impact of microwave performance specifications of the MEM switch on its mechanical structure and design. In particular, quantitative discussion of switch parameters including actuation voltage, actuation frequency, loss, and isolation will be presented. (29 Refs)
Subfile: B C
Descriptors: electrostatic devices; microactuators; signal processing; space vehicle electronics; switches
Identifiers: mechanical considerations; MEM switches; aerospace applications; Microelectromechanical Systems; MEMS; spacecraft GN&C; on-board communications; electrostatic microelectromechanical (MEM) switch; microwave signal processing; space-based communications systems; mechanical structure; switch parameters; actuation voltage; actuation frequency; loss; isolation
Class Codes: B2575 (Micromechanical device technology); B2180B (Relays and switches); B7630 (Avionic systems and aerospace instrumentation); B5180D (Electrostatic devices); B8380 (Control gear and apparatus); C3360L (Aerospace control); C3260B (Electric actuators and final control equipment)

26/5/4 (Item 4 from file: 2)
DIALOG(R)File 2:INSPEC

5573831 INSPEC Abstract Number: A9712-4260B-001, B9706-4320J-079
Title: Performance and applications of wide-temperature DFB lasers
Author(s): Gee, C.M.; Chen, T.R.; Paslaski, J.; Schrans, T.P.; Bar-Chaim, N.
Author Affiliation: Ortel Corp., Alhambra, CA, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.2844 p.15-26
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1996 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1996)2844L.15:PAWT;1-Y
Material Identity Number: C574-97018
U.S. Copyright Clearance Center Code: 0 8194 2232 0/96/$6.00
Conference Title: Photonics and Radio Frequency
Conference Sponsor: SPIE
Conference Date: 7-8 Aug. 1996 Conference Location: Denver, CO, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Applications (A); Practical (P); Experimental (X)
Abstract: Wide temperature Distributed-Feedback (DFB) lasers will enable cost-effective high dynamic range fiber optic links for military and commercial applications, including military shipboard **antenna** remoting, **phased array** radar, wireless communications and broadband interactive networks. By eliminating the need for thermoelectric cooling, systems will benefit from lower power consumption, cost and complexity. In this paper, we present designs for wide temperature DFB lasers and single-mode performance from -15 degrees C to 85 degrees C. (0 Refs)
Subfile: A B
Descriptors: broadband networks; distributed feedback lasers; military communication; optical fibre communication; optical transmitters; phased array radar; quantum well lasers
Identifiers: wide-temperature DFB lasers; fiber optic links; military applications; commercial applications; shipboard antenna remoting; phased array radar; wireless communications; broadband interactive networks; thermoelectric cooling; power consumption; single-mode performance; -15 to 85 degC
Class Codes: A4260B (Design of specific laser systems); A4255P (Lasing action in semiconductors); A4280S (Optical communications devices); B4320J (Semiconductor lasers); B6260 (Optical links and equipment); B6320 (Radar

equipment, systems and [redacted]plications); B7930 (Military C[redacted]unications)
Numerical Indexing: temperature 2.58E+02 to 3.58E+02 K

26/5/5 (Item 5 from file: 2)
DIALOG(R)File 2:INSPEC

5422342 INSPEC Abstract Number: A9624-8760I-003
Title: /sup 1/H MRI phase thermometry in vivo in canine brain, muscle, and tumor tissue
Author(s): MacFall, J.R.; Prescott, D.M.; Charles, H.C.; Samulski, T.V.
Author Affiliation: Dept. of Radiol., Duke Univ. Med. Center, Durham, NC, USA
Journal: Medical Physics vol.23, no.10 p.1775-82
Publisher: AIP for American Assoc. Phys. Med,
Publication Date: Oct. 1996 Country of Publication: USA
CODEN: MPHYA6 ISSN: 0094-2405
SICI: 0094-2405(199610)23:10L.1775:PTVC;1-B
Material Identity Number: M190-96011
U.S. Copyright Clearance Center Code: 0094-2405/96/23(10)1775(8)$10.00
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: The temperature sensitivity of the chemical shift of water (approximately 0.01 ppm/ degrees C) provides a potential method to monitor temperature changes in vivo or in vitro through the changes in phase of a gradient-echo magnetic resonance (MR) image. This relation was studied at 1.5 T in gel materials and in vivo in canine brain and muscle tissue, heated with a radio frequency (rf) annular **phased array** hyperthermia **antenna** . The rf fields associated with heating (130 MHz) and imaging (64 MHz) were decoupled using bandpass filters providing isolation in excess of 100 dB, thus allowing simultaneous imaging and rf heating without deterioration of the MR image signal-to-noise ratio. In a gel, temperature sensitivity of the MR image phase was observed to be (4.41+or-0.02) phase degrees/ degrees C for T/sub e/=20 ms, which allowed temperature changes of 0.22 degrees C to be resolved for a 50-mm/sup 3/ region in less than 10 s of data acquisition. In vivo, for T/sub e/=20 ms, the temperature sensitivity was (3.2+or-0.1) phase degrees/ degrees C for brain tissue, (3.1+or-0.1) phase degrees/ degrees C for muscle, and (3.0+or-0.2) phase degrees/ degrees C for a muscle tumor (sarcoma), allowing temperature changes of 0.6 degrees C to be resolved in a 16-mm/sup 3/ volume in less than 10 s of data acquisition. We conclude that, while the technique is very sensitive to magnetic field inhomogeneity, stability, and subject motion, it appears to be useful for in vivo temperature change measurement. (11 Refs)
Subfile: A
Descriptors: biomedical NMR; brain; chemical shift; hyperthermia; muscle; radiofrequency heating; temperature measurement
Identifiers: /sup 1/H MRI phase thermometry; in vivo; canine brain; tumor tissue; canine muscle; water chemical shift; temperature sensitivity; temperature changes monitoring; radiofrequency annular phased array hyperthermia antenna; bandpass filters; MR image signal-to-noise ratio; gel materials; sarcoma; magnetic field inhomogeneity; subject motion; 20 ms; 130 MHz; 64 MHz; 100 dB; 1.5 T; 10 s; H
Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy) ; A8740 (Biomagnetism); A8770E (Patient diagnostic methods and instrumentation); A8760G (Microwaves and other electromagnetic waves (medical uses)); A8770H (Radiation therapy); A8716 (Biothermics)
Chemical Indexing:
H el (Elements - 1)
Numerical Indexing: time 2.0E-02 s; frequency 1.3E+08 Hz; frequency 6.4E+07 Hz; noise figure 1.0E+02 dB; magnetic flux density 1.5E+00 T; time 1.0E+01 s

26/5/6 (Item 6 from file: 2)

DIALOG(R)File 2:INSPEC

5349469 INSPEC Abstract Number: B9610-5270D-005

Title: Twenty-GHz broadband microstrip array with electromagnetically coupled high T/sub c/ superconducting feed network

Author(s): Herd, J.S.; Poles, L.D.; Kenney, J.P.; Derov, J.S.; Champion, M.H.; Silva, J.H.; Davidovitz, M.; Herd, K.G.; Bocchi, W.J.; Mittleman, S.D.; Hayes, D.T.

Author Affiliation: Rome Lab., Hanscom AFB, MA, USA

Journal: IEEE Transactions on Microwave Theory and Techniques vol.44, no.7, pt.2 p.1384-9

Publisher: IEEE,

Publication Date: July 1996 Country of Publication: USA

CODEN: IETMAB ISSN: 0018-9480

SICI: 0018-9480(199607)44:7:2L.1384:TBMA;1-S

Material Identity Number: I045-96010

U.S. Copyright Clearance Center Code: 0018-9480/96/$05.00

Document Number: S0018-9480(96)04786-2

Language: English Document Type: Journal Paper (JP)

Treatment: Practical (P)

Abstract: The use of high-temperature superconducting (HTS) feed lines and phase shifters can substantially improve the performance of microwave and millimeter-wave printed **phased array antennas** . A novel **antenna** architecture is described that provides a broadband radiating aperture to be used as a scanning array with compatible low-loss HTS phase shifters. The approach follows an earlier design demonstrated at 12 GHz, and this work extends the approach to 20 GHz. The antenna design, radiation patterns, bandwidth measurements, and thermal analysis are reported. A prototype thermal isolator design is described that reduces the heat load of coaxial interconnections between cryocooled and room temperature systems. (26 Refs)

Subfile: B

Descriptors: antenna feeds; antenna phased arrays; antenna radiation patterns; high-temperature superconductors; microstrip antenna arrays; microwave phase shifters; superconducting microwave devices; thermal analysis

Identifiers: broadband microstrip array; EM coupled feed network; high T/sub c/ superconducting feed network; high-temperature superconducting feed lines; phase shifters; antenna architecture; broadband radiating aperture; scanning array; low-loss HTS phase shifters; radiation patterns; bandwidth measurements; thermal analysis; thermal isolator design; HTSC feed network; 20 GHz

Class Codes: B5270D (Antenna arrays); B5270F (Antenna accessories); B3240G (Other superconducting material applications and devices)

Numerical Indexing: frequency 2.0E+10 Hz

26/5/7 (Item 7 from file: 2)

DIALOG(R)File 2:INSPEC

5056922 INSPEC Abstract Number: B9511-6250F-022

Title: A multilayered microstrip phased array for mobile satellite communications

Author(s): Telikepalli, R.; Musclow, T.

Author Affiliation: CAL Corp., Ottawa, Ont., Canada

Conference Title: 1995 MTT-S Symposium on Technologies for Wireless Applications Digest (Cat. No.95TH0661-9) p.175-80

Editor(s): Dawe, G.C.

Publisher: IEEE, New York, NY, USA

Publication Date: 1995 Country of Publication: USA 194 pp.

ISBN: 0 7803 1982 6

U.S. Copyright Clearance Center Code: TH0661-9/95/0000-0175$01.00

Conference Title: Proceedings of 1995 IEEE MTT-S International Topical Symposium on Technologies for Wireless Applications (Conjunction with INTER COMM'95)

Conference Date: 20[redacted]2 Feb. 1995 Conference Location: Vancouver, BC, Canada

Language: English Document Type: Conference Paper (PA)

Treatment: Applications (A); Practical (P); Experimental (X)

Abstract: A multilayered microstrip **phased array antenna** was designed and developed to suit the requirements of a mobile satellite system. The antenna developed was of low profile, mechanically steerable in azimuth plane, had a fixed beam in elevation plane to provide a coverage from 40 degrees to 65 degrees above horizon, a minimum G/T of -12 dBK over a frequency span of 135 MHz, side lobe levels of 13 dB below the beam peak. The paper describes the design, pattern, gain and noise temperature measurements of the developed array. (3 Refs)

Subfile: B

Descriptors: antenna phased arrays; antenna radiation patterns; microstrip antenna arrays; mobile antennas; mobile satellite communication; satellite antennas

Identifiers: mobile satellite system; mobile satellite communications; multilayered microstrip phased array antenna; low profile mechanically steerable antenna; azimuth plane; elevation plane; coverage; G/T; frequency span; side lobe levels; antenna pattern; gain; noise temperature measurements; 135 GHz

Class Codes: B6250F (Mobile radio systems); B6250G (Satellite relay systems); B5270D (Antenna arrays)

Numerical Indexing: frequency 1.35E+11 Hz

26/5/8 (Item 8 from file: 2)

DIALOG(R)File 2:INSPEC

5053325 INSPEC Abstract Number: B9511-5270D-004

Title: Packaging design of wide-angle phased-array antenna for frequencies above 20 GHz

Author(s): Riemer, D.E.

Author Affiliation: Defense & Space Group, Boeing Co., Seattle, WA, USA

Journal: IEEE Transactions on Antennas and Propagation vol.43, no.9 p.915-20

Publication Date: Sept. 1995 Country of Publication: USA

CODEN: IETPAK ISSN: 0018-926X

U.S. Copyright Clearance Center Code: 0018-926X/95/$04.00

Language: English Document Type: Journal Paper (JP)

Treatment: Practical (P)

Abstract: Mechanical aspects of a new **phased - array antenna** design with a scan angle of +or-70 degrees are presented. New packaging concepts were needed to accomplish, an industry first, the fabrication of a 91-element 44-GHz transmit array. The array architecture uses one hybrid module per channel. The RF signal is radiatively coupled to the modules, eliminating RF connectors. Multilayer boards are used to distribute control signals and DC which are connected to each module with space-efficient elastomeric connectors. All connections are made during the assembly of the array without need for permanent bonding. The array is designed for a low conductive thermal impedance from the monolithic microwave integrated circuits (MMIC) chips to the back of the array, where the heat is removed by convection. (7 Refs)

Subfile: B

Descriptors: antenna feeds; antenna phased arrays; cooling; millimetre wave antenna arrays; MIMIC; multichip modules; printed circuits; radio transmitters; scanning antennas; transmitting antennas

Identifiers: packaging design; wide-angle phased-array antena; scan angle ; fabrication; 91-element 44-GHz transmit array; array architecture; RF signal; radiative coupling; multilayer boards; control signals distribution ; DC distribution; space-efficient elastomeric connectors; low conductive thermal impedance; monolithic microwave integrated circuits chips; MMIC chip; heat removal; convection; 44 GHz

Class Codes: B5270D (Antenna arrays); B5270F (Antenna accessories); B2250 (Multichip modules); B1350H (Microwave integrated circuits)

Numerical Indexing: frequency 4.4E+10 Hz

26/5/9 (Item 9 from file: 2)
DIALOG(R)File 2:INSPEC

4679874 INSPEC Abstract Number: A9413-8760G-030, B9407-7520C-006
Title: Adaptive radiofrequency hyperthermia-phased array system for improved cancer therapy: phantom target measurements
Author(s): Fenn, A.J.; King, G.A.
Author Affiliation: Lincoln Lab., MIT, Lexington, MA, USA
Journal: International Journal of Hyperthermia vol.10, no.2 p. 189-208
Publication Date: March-April 1994 Country of Publication: UK
CODEN: IJHYEQ ISSN: 0265-6736
U.S. Copyright Clearance Center Code: 0265-6736/94/$10.00
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: A computer-controlled adaptive radio-frequency hyperthermia system for improved therapeutic tumour heating is experimentally investigated. Adaptive array feedback techniques are used to modify the electric-field and temperature distribution in hyperthermia experiments with homogenous and heterogeneous phantom targets. A commercial hyperthermia **phased - array antenna** system at the SUNY Health Science Center in Syracuse, New York, has been modified to implement adaptive nulling and adaptive focusing algorithms. The hyperthermia system is the BSD Medical Corporation Model BSD-2000 with Sigma-60 annular **phased - array antenna** applicator. The transmit **phased array** system is made adaptive by software modifications which invoke a gradient-search feedback algorithm. The gradient-search algorithm implements the method of steepest descent for adaptive nulling (power minimization) and the method of steepest ascent for adaptive focusing (power maximization). The feedback signals are provided by electric-field short-dipole probe antennas. With an adaptive hyperthermia array using real-time measured data, it may be possible to maximize the applied electric field at a tumour position in a complex scattering target body and simultaneously minimize or reduce the electric field at target positions where undesired high-temperature regions (hot spots) occur. The measured phantom-target data indicate that adaptive nulling can reduce the electric field at one or more target positions while simultaneously focusing the electric field at a deep-seated position within the target. (59 Refs)
Subfile: A B
Descriptors: antenna phased arrays; biomedical equipment; biothermics; radiation therapy; radiofrequency heating
Identifiers: adaptive radiofrequency hyperthermia-phased array system; cancer therapy; phantom target measurements; therapeutic tumour heating; electric-field distribution; temperature distribution; adaptive nulling; adaptive focusing algorithms; gradient-search feedback algorithm; power minimization; power maximization; electric-field short-dipole probe antennas; undesired high-temperature regions; hot spots; medical instrumentation
Class Codes: A8760G (Laser beams, microwaves, and other electromagnetic waves); A8770G (Patient care and treatment); A8716 (Biothermics); B7520C (Radiation therapy); B5270D (Antenna arrays)

26/5/10 (Item 10 from file: 2)
DIALOG(R)File 2:INSPEC

4612994 INSPEC Abstract Number: A9407-5250-009
Title: Direct electron heating and current drive with fast waves in DIII-D
Author(s): Pinsker, R.I.; Petty, C.C.; Porkolab, M.; Baity, F.W.; Bonoli, P.T.; Callis, R.W.; Cary, W.P.; Chiu, S.C.; Freeman, R.L.; Goulding, R.H.; Degrassie, J.S.; Harvey, R.W.; Hoffman, D.J.; James, R.A.; Kawashima, H.; Luce, T.C.; Mayberry, M.J.; Prater, R.
Author Affiliation: Gen. Atomics, San Diego, CA, USA

Conference Title: Plasma Physics and Controlled Nuclear Fusion Research 1992. Proceedings of the Fourteenth International Conference on Plasma Physics and Controlled Nuclear Fusion Research p.683-92 vol.1
Publisher: IAEA, Vienna, Austria
Publication Date: 1993 Country of Publication: Austria 4 vol. (791+689+562+77) pp.
Conference Sponsor: IAEA
Conference Date: 30 Sept.-7 Oct. 1992 Conference Location: Wuerzburg, Germany
Language: English Document Type: Conference Paper (PA)
Treatment: Experimental (X)
Abstract: Experiments on the DIII-D tokamak have been performed to evaluate noninductive current drive with direct electron absorption of the fast Alfven wave (FW) in the ion cyclotron range of frequencies. These experiments have employed a 2 MW 60 MHz transmitter connected to a four-element toroidally **phased array** of loop **antennas** located at the outside midplane of the DIII-D vacuum vessel. Efficient direct electron heating was obtained with (O, pi ,O, pi) antenna phasing; H-mode confinement was obtained with direct electron absorption of the fast wave as the sole source of auxiliary heating. Current drive experiments were performed with (O, pi /2, pi ,3 pi /2) antenna phasing at fast wave power levels up to 1.2 MW. Preheating with 60 GHz ECH was used to increase the single-pass absorption of the fast wave with a directive spectrum. When the fast wave is launched in the direction that aids the inductively driven current (co-current drive), up to 40% of the 0.4 MA plasma current is sustained noninductively. Counter-current drive strongly affects the sawtoothing behavior, and results in highly peaked electron temperature profiles (T/sub e/(O)<or approximately= 6 keV) but much smaller driven currents. (17 Refs)
Subfile: A
Descriptors: plasma radiofrequency heating; plasma toroidal confinement; plasma transport processes; plasma waves
Identifiers: direct electron heating; ICRF heating; preheating; counter-current drive; noninductively sustained current; fast waves; DIII-D ; tokamak; noninductive current drive; direct electron absorption; fast Alfven wave; ion cyclotron range of frequencies; four-element toroidally phased array; loop antennas; outside midplane; vacuum vessel; (O, pi ,O, pi) antenna phasing; H-mode confinement; (O, pi /2, pi ,3 pi /2) antenna phasing; power levels; single-pass absorption; directive spectrum; inductively driven current; co-current drive; sawtoothing behavior; electron temperature profiles; 2 MW; 60 MHz; 1.2 MW; 6 keV; 0.4 MA
Class Codes: A5250G (Plasma heating); A5255G (Plasma in torus (stellarator, tokamak, etc.)); A5225F (Transport properties); A5235B (Magnetohydrodynamic waves, Alfven and hydromagnetic waves)
Numerical Indexing: power 2.0E+06 W; frequency 6.0E+07 Hz; power 1.2E+06 W; electron volt energy 6.0E+03 eV; current 4.0E+05 A

26/5/11 (Item 11 from file: 2)
DIALOG(R)File 2:INSPEC

04301483 INSPEC Abstract Number: A9302-4280E-002, B9301-4170-011
Title: Multichannel Bragg cells: design, performance, and applications
Author(s): Pape, D.R.
Author Affiliation: Photonic Systems Inc., Melbourne, FL, USA
Journal: Optical Engineering vol.31, no.10 p.2148-58
Publication Date: Oct. 1992 Country of Publication: USA
CODEN: OPEGAR ISSN: 0091-3286
U.S. Copyright Clearance Center Code: 0091-3286/92/$2.00
Language: English Document Type: Journal Paper (JP)
Treatment: Experimental (X)
Abstract: Multichannel Bragg cell design principles are discussed for both multichannel deflectors and modulators. Particular emphasis is placed on minimization of acoustic and electrical crosstalk and thermal effects through the use of acoustically anisotropic materials, RF stripline techniques, and high thermal conductivity materials. The use of a self-collimating shear mode in gallium phosphide (GaP) is found to

substantially reduce acoustic crosstalk from that found in the commonly used tellurium dioxide cells. The use of stripline transmission lines substantially reduces electrical crosstalk over that obtained using the more conventional microstrip techniques. The performance is described of three different GaP multichannel Bragg cell deflectors and a GaP multichannel Bragg cell modulator designed using the principles Bragg cell deflectors and a GaP multichannel Bragg cell modulator designed using the principles outlined. Optical processing systems using multichannel Bragg cells for **phased array antenna** signal processing, multichannel RF spectrum analysis, and digital optical computing are discussed. (27 Refs)

Subfile: A B

Descriptors: acousto-optical devices; crosstalk; gallium compounds; III-V semiconductors; optical deflectors; optical information processing; optical modulation; spectral analysers

Identifiers: acousto-optic cells; III-V semiconductor; optical information processing systems; design principles; multichannel deflectors; crosstalk; thermal effects; acoustically anisotropic materials; RF stripline techniques; high thermal conductivity materials; self-collimating shear mode; performance; multichannel Bragg cell deflectors; multichannel Bragg cell modulator; phased array antenna signal processing; multichannel RF spectrum analysis; digital optical computing; GaP cells

Class Codes: A4280E (Shutters, windows, diaphragms, deflectors, choppers, and optical scanners); A4280K (Optical beam modulators); A4230 (Optical information, image formation and analysis); B4170 (Acousto-optical devices); B6140C (Optical information and image processing); B7210X (Other instrumentation and measurement systems)

Chemical Indexing:

GaP int - Ga int - P int - GaP bin - Ga bin - P bin (Elements - 2)

26/5/12 (Item 12 from file: 2)

DIALOG(R)File 2:INSPEC

03994381 INSPEC Abstract Number: B91071335

Title: Signal distribution techniques for active phased-array antennas

Author(s): Wong, H.; Chang, S.S.; Ho, T.Q.

Author Affiliation: Hughes Aircraft Co., Space & Comm. Group, El Segundo, CA, USA

Journal: Microwave Journal vol.34, no.6 p.147-51, 154

Publication Date: June 1991 Country of Publication: USA

CODEN: MCWJAD ISSN: 0026-2897

Language: English Document Type: Journal Paper (JP)

Treatment: Practical (P)

Abstract: The authors describe various EHF signal distribution techniques that can be applied to active **phased - array antennas** . The emphasis is on waveguide type structures that inherently have low insertion loss, good thermal conductivity are are rigid to support MMIC subarray modules of which active antennas are comprised. (5 Refs)

Subfile: B

Descriptors: active antennas; antenna feeders; antenna phased arrays; microwave antenna arrays; waveguide antennas

Identifiers: MM-wave frequencies; K-band; active phased-array antennas; EHF signal distribution techniques; waveguide type structures; low insertion loss; thermal conductivity; MMIC subarray modules

Class Codes: B5270D (Antenna arrays); B5270F (Antenna accessories)

26/5/13 (Item 13 from file: 2)

DIALOG(R)File 2:INSPEC

02001294 INSPEC Abstract Number: B83013897

Title: Ultra-high average power ferrite phase shifter for phased array radar

Author(s): Izutani, T.; Itoh, S.; Hashimoto, Y.; Yonekura, M.; Hashimoto, T.; Aiba, J.

Author Affiliation: Radio Application Div., Nippon Electric Co. Ltd.,

Tokyo, Japan
Conference Title: Ferrites. Proceedings of the ICF 3. Third International Conference on Ferrites p.857-9
Editor(s): Watanabe, H.; Iida, S.; Sugimoto, M.
Publisher: Reidel, Dordrecht, Netherlands
Publication Date: 1982 Country of Publication: Netherlands xlii+990 pp.
ISBN: 90 277 1413 4
Conference Date: 29 Sept.-2 Oct. 1980 Conference Location: Kyoto, Japan
Language: English Document Type: Conference Paper (PA)
Treatment: Applications (A); Practical (P)
Abstract: When a conventionally designed phase shifter is used in a high power condition, temperature differences develop in the garnet, resulting in longitudinal shearing forces and magnetostriction effects. With the authors' S-band phase shifter, the maximum differential phase is reduced by 25-35% at an average input power of 300 W. This would cause undesirable grating sidelobes of up to -13 dB in a **phased array antenna** , it was estimated. In order to decrease the phase error by reducing garnet temperature variation, simple plates of BN (boron nitride) which have high thermal conductivity were attached to both sides of the garnet. Results of high power tests with the improved phase shifter showed that the temperature variation in the garnet was reduced to about one-third, and the maximum differential phase shift error was reduced to about 10%. Grating sidelobes were also greatly reduced and satisfactory radar operation was confirmed. (0 Refs)
Subfile: B
Descriptors: antenna accessories; antenna phased arrays; ferrite devices; phase shifters; radar antennas
Identifiers: high power ferrite phase shifter; antenna phased arrays; antenna accessories; phased array radar; S-band phase shifter; maximum differential phase; average input power; grating sidelobes; BN; thermal conductivity; garnet
Class Codes: B3120G (Microwave devices); B5270F (Antenna accessories)

26/5/14 (Item 14 from file: 2)
DIALOG(R)File 2:INSPEC

01881845 INSPEC Abstract Number: A82062731, B82038515
Title: Theoretical comparison of temperature distributions produced by several hyperthermia systems: magnetrode type solenoids, interstitial RF electrodes, interstitial microwave antennas , **and microwave** phased arrays
Author(s): Strohbehn, J.W.
Author Affiliation: Thayer School of Engng., Dartmouth Coll., Hanover, NH, USA
Conference Title: Proceedings of the Tenth Annual Northeast Bioengineering Conference p.95-6
Editor(s): Hansen, E.W.
Publisher: IEEE, New York, NY, USA
Publication Date: 1982 Country of Publication: USA xi+356 pp.
Conference Date: 15-16 March 1982 Conference Location: Hanover, NH, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Theoretical (T)
Abstract: Summary form only given. The comparison described is based on numerical solutions of the bio-heat equation. In each case the specific absorption rate (SAR), which is the power deposited per unit volume of tissue, is calculated from the appropriate electromagnetic equations. In most cases a two-dimensional model is used, and it is assumed that the tissue properties are homogeneous. Both the steady-state temperature distributions and the transient responses are calculated. The particular systems investigated include two regional type hyperthermia systems: circular magnetic coils (solenoids), and microwave phased arrays. In both cases these devices encircle the patient's torso or limb, and are intended to give deep-seated heating. (0 Refs)

Subfile: A B
Descriptors: biomedical equipment; biothermics; radiation therapy; radiofrequency heating; temperature distribution
Identifiers: numerical solution; medical equipment; EM equations; temperature distributions; hyperthermia systems; magnetrode type solenoids; interstitial RF electrodes; interstitial microwave antennas; microwave phased arrays; bio-heat equation; specific absorption rate
Class Codes: A8716 (Biothermics); A8760G (Laser beams, microwaves, and other electromagnetic waves); A8770G (Patient care and treatment); B7520C (Radiation therapy)

26/5/15 (Item 15 from file: 2)
DIALOG(R)File 2:INSPEC

01224024 INSPEC Abstract Number: B78034330, C78019944
Title: Controlling temperatures **in** phased array antennas **(by wickless heat pipe)**
Author(s): Porter, R.F.
Author Affiliation: Systems Dev. Div., Westinghouse Defense & Electronic Systems Center, Baltimore, MD, USA
Conference Title: IEEE 1977 Mechanical Engineering in Radar Symposium p.128-31
Publisher: IEEE, New York, NY, USA
Publication Date: 1977 Country of Publication: USA x+244 pp.
Conference Sponsor: IEEE
Conference Date: 8-10 Nov. 1977 Conference Location: Arlington, VA, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Applications (A)
Abstract: Phased array antennas are notoriously sensitive to both temperature variations and gradients. At the same time, there is always the desire to operate at as low a temperature as possible. A new technique is described which will meet these requirements in an environment ranging from -54 degrees to +125 degrees C. It maintains the antenna at temperatures lower than the ambient without using any electrical power. (0 Refs)
Subfile: B C
Descriptors: antenna phased arrays; heat sinks; temperature control
Identifiers: phased array antennas; wickless heat pipe; -54degrees to +125degrees C; temperature control; RF manifold plate; heat sink
Class Codes: B0170J (Product packaging); B5270D (Antenna arrays); C3120N (Thermal variables); C3370H (Radio and radar)

26/5/16 (Item 16 from file: 2)
DIALOG(R)File 2:INSPEC

00715318 INSPEC Abstract Number: B75003332
Title: EM window thermal barriers
Author(s): Purinton, D.
Author Affiliation: Texas Instruments Inc., Dallas, TX, USA
Conference Title: 12th Symposium on Electromagnetic Windows p.28-32
Editor(s): Harris, J.N.
Publisher: Georgia Inst. Technol, Atlanta, GA, USA
Publication Date: 1974 Country of Publication: USA vi + 167 pp.
Conference Sponsor: Georgia Inst. Technol
Conference Date: 12-14 June 1974 Conference Location: Atlanta, GA, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Practical (P)
Abstract: All airborne **phased array antenna** systems require an RF transparent radome to protect the array from the environmental effects of the moving air, rain, dust, and even lightning. At velocities above Mach 2, protection is also required from aerodynamic heating. The necessity for a thermal barrier is compounded by the large amounts of power dissipated internally by a high-power array and by the need for temperature control. Its addition can reduce the total array heat load, as well as the changes

in heat load which accompany aircraft velocity variations. This paper discusses thermal barrier mechanical, electrical, and thermal design considerations. (0 Refs)
Subfile: B
Descriptors: aircraft; antenna phased arrays; design engineering; thermal insulation
Identifiers: mechanical design; electrical design; airborne phased array antenna systems; radome; aerodynamic heating; thermal barrier; thermal design
Class Codes: B5270D (Antenna arrays); B5270F (Antenna accessories)

26/5/17 (Item 17 from file: 2)
DIALOG(R)File 2:INSPEC

00704826 INSPEC Abstract Number: B75001254
Title: AN/SPY-1 phased-array antenna
Author(s): Scudder, R.M.; Sheppard, W.H.
Author Affiliation: RCA Labs., Moorestown, NJ, USA
Journal: Microwave Journal vol.17, no.5 p.51-5
Publication Date: May 1974 Country of Publication: USA
CODEN: MCWJAD ISSN: 0026-2897
Language: English Document Type: Journal Paper (JP)
Treatment: New Developments (N); Practical (P); Experimental (X)
Abstract: The **phased - array antenna** described in this paper is a major unit of the AN/SPY-1 radar which, in turn, is a segment of the AEGIS Shipboard Weapons System. The description includes the radiating elements the garnet phase shifters and their drivers utilized to implement the beam steering functions, the RF beam-forming networks, the temperature-control system and the basic mechanical structure. The component description outlines the design considerations and performance results of the phase-shifter elements. Included in the mechanical structure description is the impact of the shipboard operational environment. Representative antenna performance parameters and test results are outlined. (6 Refs)
Subfile: B
Descriptors: antenna phased arrays; mobile antennas; radar systems
Identifiers: AN/SPY 1 system; radar systems; AEGIS Shipboard Weapons System; garnet phase shifters
Class Codes: B5270D (Antenna arrays); B6320 (Radar systems and equipment)

26/5/18 (Item 18 from file: 2)
DIALOG(R)File 2:INSPEC

00462990 INSPEC Abstract Number: A72079418, B73001141, C72024985
Title: An adaptive on-line two-dimensional electro-optical spatial light modulator for ODP
Author(s): Casasent, D.
Author Affiliation: Carnegie-Mellon Univ., Pittsburgh, PA, USA
Conference Title: 1972 Annual Meeting of the Optical Society of America. Abstracts only p.36
Publisher: Optical Soc. America, Washington, DC, USA
Publication Date: 1972 Country of Publication: USA 88 pp.
Conference Sponsor: Optical Soc. America
Conference Date: 17-20 Oct. 1972 Conference Location: San Francisco, CA, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Practical (P)
Abstract: A solid-state two-dimensional spatial light modulator with imaging information processing and display applications will be presented. The system consists of a thin 5.1*5.1*0.025-cm transparent KD*P target crystal on which an off-axis electron gun modulated by an input electrical signal deposits a charge pattern. This crystal belongs to the 42m point group and as such exhibits the linear-longitudinal electro-optic or Pockels effect by which this charge pattern and the resultant two-dimensional

voltage and electric field distribution across the crystal surface can modulate an incident collimated laser beam point by point, thus resulting in an on-line two-dimensional optical modulator whose light transmission is an electrically controllable function of position. With Curie point operation of the crystal, the ratio of longitudinal to transverse dielectric constant changes dramatically, resulting in a thinner effective crystal thickness, an increased resolution, and a storage mode of operation. Erasure is achieved by a second electron gun and secondary emission. The theory, operating principles, and experimental data on the modulation, erasure mechanisms, and the temperature control are presented. The use of the KD*P light valve as a on-line display device at TV resolution with a write, read, and erase mode in synchronization with TV rates will be shown, as well as the system's ability to form two-dimensional Fourier transforms on-line and perform the spatial filtering and correlation operations necessary in optical data processing and pattern recognition. The system's applicability to processing **phased array antenna** data, fingerprints, and other data fonts as well as its interaction with a digital computer in an automated feedback control loop to form a hybrid optical/digital processor will also be reported.

Subfile: A B

Descriptors: computer aided analysis; electro-optical effects; modulators ; online operation; optical instruments; optical modulation; optics; optoelectronic devices

Identifiers: KH/sub 2/PO/sub 4/; optical digital processor; ODP; imaging; information processing; display; electron gun; charge pattern; laser beam; Curie point operation; Erasure; Fourier transforms; spatial filtering; correlation; optical data processing; pattern recognition; digital computer ; automated feedback control loop; adaptive; on line; two dimensional; electro optical spatial light modulator

Class Codes: A0760 (Optical instruments and techniques); A4230 (Optical information, image formation and analysis); A4280K (Optical beam modulators); A4280 (Optical devices, techniques and applications); B4150 (Electro-optical devices)

26/5/19 (Item 19 from file: 2)

DIALOG(R)File 2:INSPEC

00044268 INSPEC Abstract Number: B69013891

Title: Combined acquisition and tracking radar. A parametric study (final technical Report)

Issued by: Texas Instruments, Inc., Equipment Group, Dallas, TX, USA

Publication Date: July 1968 Country of Publication: USA 438 pp.

Report Number: NASA-CR-92249 Contract Number: NAS9-7678

Availability: CFSTI, Springfield, VA 22151, USA

Language: English Document Type: Report (RP)

Abstract: To support design parameters for development of a phased-array radar system to be used as an experiment on board an Apollo spacecraft, investigations were conducted into radar subsystem areas which are most affected by the **phased - array** nature of the **antenna** . These areas included antenna, array components, signal processing, data processing, thermal control, and reliability. Candidate system configurations include corporate-fed, active element arrays and space-fed, front- or rear-illustrated arrays. The frequency range of interest is 1.5 to 20 GHz. The nominal tracking problem is to be able to acquire and track a 50 m/sup 2/ target at a range of 100 nm. Early parts of the study result in a weight limitation of the radar of 350 pounds, a size limitation on the array of a six-foot diameter, and a prime power limitation of 1000 watts to the array. Under these limitations an optimization procedure is performed which maximizes the returned signal-to-noise ratio for each of six discrete frequencies chosen as candidates, and for the three types of arrays. The optimum system under the assumed limitations included a 292-element. 1.5-GHz corporate-fed, active-element array which yielded satisfactory acquisition and tracking performance at a range of 110 nm for a 50 m/sup 2/ target.

Subfile: B

Descriptors: antenna travelling wave arrays; radar systems; space

vehicles; tracking systems
Class Codes: B5270D (Antenna arrays); B6320 (Radar systems and equipment); B7610 (General aspects of space vehicles and satellites)

26/5/20 (Item 1 from file: 6)
DIALOG(R)File 6:NTIS

2173978 NTIS Accession Number: N20000057365/XAB
New Millennium Program: Validating Advanced Technologies for Future Space Missions
Minning, C. P. ; Luers, P.
Jet Propulsion Lab., Pasadena, CA.
Corp. Source Codes: 014828000; JJ574450
1999 16p
Languages: English
Journal Announcement: USGRDR0022; STAR3821
Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.
NTIS Prices: PC A03/MF A01
Country of Publication: United States
This presentation reviews the activities of the New Millennium Program (NMP) in validating advanced technologies for space missions. The focus of these breakthrough technologies are to enable new capabilities to fulfill the science needs, while reducing costs of future missions. There is a broad spectrum of NMP partners, including government agencies, universities and private industry. The DS-1 was launched on October 24, 1998. Amongst the technologies validated by the NMP on DS-1 are: a Low Power Electronics Experiment, the Power Activation and Switching Module, Multi-Functional Structures. The first two of these technologies are operational and the data analysis is still ongoing. The third program is also operational, and its performance parameters have been verified. The second program, DS-2, was launched January 3 1999. It is expected to impact near Mars southern polar region on 3 December 1999. The technologies used on this mission awaiting validation are an advanced microcontroller, a power microelectronics unit, an evolved water experiment and soil thermal conductivity experiment, Lithium-Thionyl Chloride batteries, the flexible cable interconnect, aeroshell/entry system, and a compact telecom system. EO-1 on schedule for launch in December 1999 carries several technologies to be validated. Amongst these are: a Carbon-Carbon Radiator, an X-band **Phased Array Antenna** , a pulsed plasma thruster, a wideband advanced recorder processor, an atmospheric corrector, lightweight flexible solar arrays, Advanced Land Imager and the Hyperion instrument.
Descriptors: *Space missions; *Technology assessment; *Technology utilization; Technologies; Cost reduction; Research and development
Identifiers: NTISNASA
Section Headings: 84A (Space Technology--Astronautics)

26/5/21 (Item 2 from file: 6)
DIALOG(R)File 6:NTIS

1801906 NTIS Accession Number: AD-A277 459/4
Adaptive Radio-Frequency Hyperthermia Phased-Array System for Improved Cancer Therapy; Phantom Target Measurements
(Technical rept)
Fenn, A. J. ; King, G. A.
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Corp. Source Codes: 009875001; 207650
19 Nov 93 62p
Languages: English
Journal Announcement: GRAI9414
Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)321-8547; and

email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.
NTIS Prices: PC A04/MF A01
Country of Publication: United States
Contract No.: F19628-90-C-0002
An adaptive radio-frequency hyperthermia system for improved therapeutic tumor heating is investigated. Adaptive array techniques are used to modify the electric-field and temperature distribution in hyperthermia experiments with phantom targets. A commercial hyperthermia **phased - array antenna** system at the SUNY Health Science Center in Syracuse, New York, has been modified to implement adaptive nulling and adaptive focusing algorithms. The hyperthermia system is the BSD Medical Corporation Model BSD-2000 with Sigma-60 annular **phased - array antenna** applicator. The applicator operates from 60 to 120 MHz and consists of four pairs of dipole antenna radiators. The four-channel transmit array is made adaptive by software modifications which invoke a gradient-search feedback algorithm. The gradient-search algorithm implements the method of steepest descent for adaptive nulling and the method of steepest ascent for adaptive focusing. The feedback signals are provided by electric-field short-dipole probe antennas. With the proposed adaptive hyperthermia array design concept, it may be possible to maximize the applied electric field at a tumor position in the target body and simultaneously minimize or reduce the electric field at target positions where undesired high-temperature regions (hot spots) occur. The measured phantom-target data indicate that adaptive nulling can reduce the electric field at one or more target positions while simultaneously focusing at a deep-seated position within the target. Tumor heating, Adaptive phased array, Microwave hyperthermia, Adaptive focusing, Cancer therapy.
Descriptors: *Cancer; *Hyperthermia; *Microwaves; *Neoplasms; *Radiotherapy; Algorithms; Dipole antennas; Dipoles; Electric fields; Feedback; Focusing; Frequency; Gradients; Heating; High temperature; Hot spots; Models; Phased arrays; Radio equipment; Signals; Targets; Therapy; Experimental data; Nulls(Amplitude)
Identifiers: NTISDODXA
Section Headings: 57E (Medicine and Biology--Clinical Medicine); 57V (Medicine and Biology--Radiobiology)

26/5/22 (Item 3 from file: 6)
DIALOG(R)File 6:NTIS

1610623 NTIS Accession Number: AD-A241 026/4
Application of Adaptive Nulling to Electromagnetic Hyperthermia for Improved Thermal Dose Distribution in Cancer Therapy
(Technical rept)
Fenn, A. J.
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Corp. Source Codes: 009875001; 207650
Sponsor: Electronic Systems Div., Hanscom AFB, MA.
Report No.: TR-917; ESD-TR-91-079
3 Jul 91 116p
Languages: English
Journal Announcement: GRAI9202
Includes errata sheet dated 5 Sep 91.
Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)321-8547; and email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.
NTIS Prices: PC A06/MF A02
Country of Publication: United States
Contract No.: F19628-90-C-0002
Adaptive nulling is applied to the problem of generating a therapeutic thermal dose distribution in electromagnetic hyperthermia treatment of cancer. A system design concept for implementing adaptive hyperthermia is introduced. With the proposed design concept, it may be possible to maximize the applied electric field at a tumor position in th target body and simultaneously minimize or reduce the electric field at target

positions where undesired high temperature regions (hot spots) occur. In a clinical situation, either a gradient search algorithm or sample matrix inversion algorithm would be used to rapidly form the adaptive null (or nulls) prior to any significant tissue heating. Analysis of an annular **phased array antenna** embedded in an infinite homogeneous medium shows the potential merit of combining adaptive nulling with conventional near-field focusing used in hyperthermia. The analysis is based on a well-known moment-method theory for conducting thin wire antennas in a homogeneous conducting medium. The theory and software used to compute the moment-method received voltage at a short-dipole probe due to a transmitting dipole array are documented. Computer simulations show that adaptive nulling can prevent undesired high-temperature regions from occurring while simultaneously heating a deep-seated tumor site.

Descriptors: Adaptive systems; Algorithms; Antenna arrays; Antennas; Cancer; Clinical medicine; Computer programs; Computerized simulation; Dipole antennas; Distribution; Dosage; Electric fields; Electromagnetism; Focusing; Gradients; High temperature; Homogeneity; Hot spots; Hyperthermia ; Near field; Neoplasms; Nulls(Amplitude); Phased arrays; Position(Location); Regions; Searching; Targets; Therapy; Thermal properties; Thinness; Transmitting; Wire

Identifiers: *Electromagnetic hyperthermia; *Cancer therapy; *Adaptive nulling; Adaptive arrays; Method-of-moments; NTISDODXA; NTISDODAF

Section Headings: 57E (Medicine and Biology--Clinical Medicine); 57V (Medicine and Biology--Radiobiology)

26/5/23 (Item 4 from file: 6)

DIALOG(R)File 6:NTIS

1310733 NTIS Accession Number: N87-15375/5

Advanced Regional Mobile Satellite System for the Nineties

Kriedte, W. ; Vernucci, A.

European Space Research and Technology Centre, Noordwijk (Netherlands).

Corp. Source Codes: 057479000; E6889478

Sponsor: National Aeronautics and Space Administration, Washington, DC.

Sep 86 6p

Languages: English

Journal Announcement: GRAI8718; STAR2507

Included in Proceedings of an ESA (European Space Agency) Workshop on Land Mobile Services by Satellite, p61-66 Jun 86.

NTIS Prices: (Order as N87-15361, PC A08/MF A01)

Country of Publication: Other

A land mobile satellite service using a multibeam **phased array antenna** with 19 spot beams and regenerative transponders in the forward and return link to serve up to 4000 telephony connections with small mobile terminals of up to 10 W RF transmit power is introduced. Critical subsystems such as the deployable antenna, reconfigurable regenerative transponder, a robust adaptive thermal control system, on-board processing for packet-based services, and, possibly, the implementation of an on-board network control station require attention. The precise identification of the satellite system role in the overall land-mobile network and of the services to be provided; propagation characteristics, and coding/automatic repeat request techniques are also very important.

Descriptors: *Antenna design; *Land mobile satellite service; *Network control; *Telephony; Systems engineering; Onboard data processing; Phased arrays; Satellite design; Transponders

Identifiers: *Foreign technology; NTISNASAE

Section Headings: 45C (Communication--Common Carrier and Satellite); 45B (Communication--Radio and Television Equipment); 84G (Space Technology--Unmanned Spacecraft)

26/5/24 (Item 1 from file: 8)

DIALOG(R)File 8:Ei Compendex(R)

03460616 E.I. Monthly No: EIM9207-039415

Title: Infrared imaging of microwave sources.
Author: Seiler, Milton R.; Haselwood, John L.; Stockum, Larry A.
Corporate Source: Battelle Memorial Inst., Columbus, OH, USA
Conference Title: Thermosense XIV: An International Conf on Thermal Sensing and Imaging Diagnostic Applications
Conference Location: Orlando, FL, USA Conference Date: 19920422
Sponsor: SPIE - Int Soc for Opt Engineering, Bellingham, WA, USA
E.I. Conference No.: 16469
Source: Proceedings of SPIE - The International Society for Optical Engineering v 1682. Publ by Int Soc for Optical Engineering, Bellingham, WA, USA. p 296-307
Publication Year: 1992
CODEN: PSISDG ISSN: 0277-786X ISBN: 0-8194-0843-3
Language: English
Document Type: PA; (Conference Paper) Treatment: A; (Applications); X; (Experimental)
Journal Announcement: 9207
Abstract: An infrared imaging technique for testing phased array radars at the system level in the field has been defined and demonstrated in a laboratory test setup. The technique uses a thin radar absorbing film material which is placed near the antenna structure to create thermal patterns which are viewed by an infrared imaging sensor. The thin film sheet resistance can be controlled to vary the absorption, reflection, and sheet temperature characteristics. The infrared image is calibrated radiometrically to provide measures of the microwave power density. Additionally, the thermal profiles show the effect of phasing differences between adjacent antenna elements. This paper describes the predicted and measured thermal characteristics of the absorbing material for a particular S-band waveguide source. This demonstration has shown the feasibility of using an imaging infrared sensor to provide rapid diagnostic evaluation of a **phased array antenna** . 7 refs.
Descriptors: *MICROWAVES--*Detectors; RADAR; ANTENNAS--Phased Arrays; INFRARED IMAGING
Identifiers: PHASED ARRAY RADAR; THIN FILM SHEET RESISTANCE; MICROWAVE POWER DENSITY
Classification Codes:
711 (Electromagnetic Waves); 716 (Radar, Radio & TV Electronic Equipment); 741 (Optics & Optical Devices)
71 (ELECTRONICS & COMMUNICATIONS); 74 (OPTICAL TECHNOLOGY)

26/5/25 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05293638 Genuine Article#: VN499 Number of References: 11
Title: H-1 MRI PHASE THERMOMETRY IN-VIVO IN CANINE BRAIN, MUSCLE, AND TUMOR-TISSUE
Author(s): MACFALL JR; PRESCOTT DM; CHARLES HC; SAMULSKI TV
Corporate Source: DUKE UNIV,MED CTR,DEPT RADIOL,BRYAN RES BLDG,ROOM 161C/DURHAM//NC/27710; DUKE UNIV,MED CTR,DEPT RADIAT ONCOL/DURHAM//NC/27710
Journal: MEDICAL PHYSICS, 1996, V23, N10 (OCT), P1775-1782
ISSN: 0094-2405
Language: ENGLISH Document Type: ARTICLE
Geographic Location: USA
Subfile: SciSearch; CC LIFE--Current Contents, Life Sciences; CC CLIN--Current Contents, Clinical Medicine
Journal Subject Category: RADIOLOGY & NUCLEAR MEDICINE
Abstract: The temperature sensitivity of the chemical shift of water (approximately 0.01 ppm/degrees C) provides a potential method to monitor temperature changes in vivo or in vitro through the changes in phase of a gradient-echo magnetic resonance (MR) image. This relation was studied at 1.5 T in gel materials and in vivo in canine brain and muscle tissue, heated with a radio frequency (rf) annular **phased array** hyperthermia **antenna** . The rf fields associated with heating (130 MHz) and imaging (64 MHz) were decoupled using bandpass filters providing isolation in excess of 100 dB, thus allowing simultaneous

imaging and rf heating without deterioration of the image signal-to-noise ratio. In a gel, temperature sensitivity of the MR image phase was observed to be (4.41+/-0.02) phase degrees/degrees C for T-e=20 ms, which allowed temperature changes of 0.22 degrees C to be resolved for a 50-mm(3) region in less than 10 s of data acquisition. In vivo, for T-e=20 ms, the temperature sensitivity was (3.2+/-0.1) phase degrees/degrees C for brain tissue, (3.1+/-0.1) phase degrees/degrees C for muscle, and (3.0+/-0.2) phase degrees/degrees C for a muscle tumor (sarcoma), allowing temperature changes of 0.6 degrees C to be resolved in a 16-mm(3) volume in less than 10 s of data acquisition. We conclude that, while the technique is very sensitive to magnetic field inhomogeneity, stability, and subject motion, it appears to be useful for in vivo temperature change measurement. (C) 1996 American Association of Physicists in Medicine.
Descriptors--Author Keywords: MAGNETIC RESONANCE IMAGING ; PHASE ; THERMOMETRY ; TEMPERATURE
Identifiers--KeyWords Plus: MOLECULAR-DIFFUSION; TEMPERATURE; HYPERTHERMIA; SHIFT
Research Fronts: 94-2335 001 (PULSED-FIELD GRADIENT SPIN-ECHO NMR; WATER DIFFUSION; RAT MODEL OF BRAIN INJURY; POLYMER SURFACTANT INTERACTION; MRI IN ACUTE CEREBRAL-ISCHEMIA)
Cited References:

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LEBIHAN D, 1989, V171, P853, RADIOLOGY
MACFALL J, 1995, V11, P73, INT J HYPERTHER
SAMULSKI TV, 1992, V8, P819, INT J HYPERTHER
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26/5/26 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

04991384 Genuine Article#: UX545 Number of References: 26
Title: 20 GHZ BROAD-BAND MICROSTRIP ARRAY WITH ELECTROMAGNETICALLY COUPLED HIGH T-C SUPERCONDUCTING FEED NETWORK
Author(s): HERD JS; POLES LD; KENNEY JP; DEROV JS; CHAMPION MH; SILVA JH; DAVIDOVITZ M; HERD KG; BOCCHI WJ; MITTLEMAN SD; HAYES DT
Corporate Source: ROME LAB/BEDFORD//MA/01731; GE CO,CORP RES & DEV/SCHENECTADY//NY/12301
Journal: IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, 1996, V44, N7 (JUL), P1384-1389
ISSN: 0018-9480
Language: ENGLISH Document Type: ARTICLE
Geographic Location: USA
Subfile: SciSearch; CC ENGI--Current Contents, Engineering, Technology & Applied Sciences
Journal Subject Category: ENGINEERING, ELECTRICAL & ELECTRONIC
Abstract: The use of high-temperature superconducting (HTS) feed lines and phase shifters fan substantially improve the performance of microwave and millimeter-wave printed **phased array antennas** . A novel **antenna** architecture is described that provides a broadband radiating aperture to be used as a scanning array with compatible low loss HTS phase shifters. The approach follows an earlier design demonstrated at 12 GHz, and this work extends the approach to 20 GHz. The antenna design, radiation patterns, bandwidth measurements, and thermal analysis are reported. A prototype thermal isolator design is described that reduces the heat load of coaxial interconnections between cryocooled and room temperature systems.
Identifiers--KeyWords Plus: FULL-WAVE ANALYSIS
Research Fronts: 94-0582 001 (FINITE-ELEMENT METHOD FOR 3-DIMENSIONAL ELECTROMAGNETIC SCATTERING; MULTILAYER PLANAR MICROWAVE CIRCUITS;

ASYMPTOTIC BOUNDARY CONDITIONS)
Cited References:
BAUHAHN P, 1985, P4, IEEE MTT MON CIRC S
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26/5/27 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus

04728757 JICST ACCESSION NUMBER: 00A0846699 FILE SEGMENT: JICST-E
A study of Ka band active phased array antenna.
HARA HIDEO (1); TOMITA EIICHI (1); MAEDA TSUYOSHI (1); KOISHI YOICHI (2); OKUMURA MINORU (2); SAKAKIBARA CHIHIRO (2); TSUJI MASAIKU (2); TANAKA YOSHIKAZU (2)
(1) Natl. Space Dev. Agency of Jpn.; (2) Toshiba Corp., Information and Industrial Systems & Serv. Co., JPN
Denshi Joho Tsushin Gakkai Gijutsu Kenkyu Hokoku(IEIC Technical Report (Institute of Electronics, Information and Communication Enginners), 2000, VOL.100,NO.244(SANE2000 37-46), PAGE.1-5, FIG.3
JOURNAL NUMBER: S0532BBG
UNIVERSAL DECIMAL CLASSIFICATION: 621.396.67
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication
ABSTRACT: This paper describes the on-board Ka band Active **Phased array Antenna** for Gigabit satellite communication system. The Ka band phased array has several advantages of wideband, and flexibility of beam scanning and on-board power distribution. The imaging reflector antenna is selected as first candidate due to the less complexity of beam forming network of antenna feed. The desirable scanning directivity performances are obtained by the iterative phase optimization process. And the small looped capillary heat pipes are compatible with the complex antenna feed To keep the thermal conductivity. (author abst.)
DESCRIPTORS: EHF; array antenna; active antenna; phased array antenna; satellite communication; broadband antenna; rain attenuation; reflector(electromagnetic); reflector antenna; mounted communication apparatus
BROADER DESCRIPTORS: frequency(Hz); frequency; antenna(electric); array circuit; circuit; space communication; telecommunication; attenuation characteristic; characteristic; reflector; aperture antenna; three dimensional antenna; communication apparatus; equipment

CLASSIFICATION CODE(S): D06000M

26/5/28 (Item 1 from file: 103)
DIALOG(R)File 103:Energy SciTec

04055988 INS-96-019716; EDB-96-139748
Title: Twenty-GHz broadband microstrip array with electromagnetically coupled high-[Tc] superconducting feed network
Author(s): Herd, J.S.; Poles, L.D.; Kenney, J.P. (Rome Lab., Hanscom AFB, MA (United States)) (and others)
Source: IEEE Transactions on Microwave Theory and Techniques v 44:7Pt2.
Coden: IETMAB ISSN: 0018-9480
Publication Date: Jul 1996
p 1384-1385
Document Type: Journal Article
Language: English
Journal Announcement: EDB9619
Subfile: ETD (Energy Technology Data Exchange); INS (US Atomindex input). IMS (DOE contractor)
US DOE Project/NonDOE Project: NP
Country of Origin: United States
Country of Publication: United States
Abstract: The use of high-temperature superconducting (HTS) feed lines and phase shifters can substantially improve the performance of microwave and millimeter-wave printed **phased array antennas** . A novel **antenna** architecture is described that provides a broadband radiating aperture to be used as a scanning array with compatible low-loss HTS phase shifters. The approach follows an earlier design demonstrated at 12 GHz, and this work extends the approach to 20 GHz. The antenna design, radiation patterns, bandwidth measurements, and thermal analysis are reported. A prototype thermal isolator design is described that reduces the heat load of coaxial interconnections between cryocooled and room temperature systems.
Major Descriptors: *ANTENNAS -- DESIGN; *ANTENNAS -- PERFORMANCE; *ANTENNAS -- SUPERCONDUCTING DEVICES
Descriptors: CRYOGENICS; ENERGY LOSSES; HIGH-TC SUPERCONDUCTORS
Broader Terms: ELECTRICAL EQUIPMENT; EQUIPMENT; LOSSES; SUPERCONDUCTORS
Subject Categories: 665412* -- Superconducting Devices -- (1992-)
426000 -- Engineering -- Components, Electron Devices & Circuits -- (1990-)
INIS Subject Categories: G6412* -- Superconducting devices -- (1992-)
E1300 -- Structures & Equipment

26/5/29 (Item 1 from file: 144)
DIALOG(R)File 144:Pascal

14047679 PASCAL No.: 99-0237887
A quick look at the expected thermal environment extremes for SBR LEO concepts
JONAS F M
Air Force Research Laboratory, Space Vehicles Directorate (Nichols Research) Phillips Research Site, Kirtland AFB, New Mexico 87117
Journal: AIP conference proceedings, 1999-01-22, 458 (1) 753-760
ISSN: 0094-243X CODEN: APCPCS Availability: INIST-21757
Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)
Country of Publication: United States
Language: English
The management and distribution of thermal energy is a critical aspect of any satellite design. Incorporation of thermal management concepts early in the system concept development is necessary in order to avoid costly redesigns as the system matures. This paper looks at the expected thermal extremes (full sun and eclipse) for a typical SBR LEO concept with a large planar **phased array antenna** in order to bound and begin definition of applicable thermal management concepts for these designs. The approach

involves application of the energy equation (radiation only) using typical ranges of absorptivity and emissivity for spacecraft materials in order to determine the resulting antenna temperatures (steady state). Radiated power (RF) and power conversion efficiencies (input to RF) were also varied. The results show that the antennas are good thermal radiators as expected, and that the issue with thermal management on the antenna will not necessarily be cooling the antenna electronics but keeping them warm enough to operate, especially in power off conditions. Recommended approaches for addressing these issues are presented in order to initiate inclusion of these preliminary concepts in the design and research process as SBR and related antenna concepts mature. (c) 1999 American Institute of Physics.

English Descriptors: Theoretical study; Artificial satellites; Spaceborne radar; Phased array radar; Thermal radiation; Temperature; Heating

French Descriptors: 0787; Etude theorique; Satellite artificiel; Radar spatial; Radar reseau commande phase; Rayonnement thermique; Temperature; Chauffe

Classification Codes: 001B00G87

26/5/30 (Item 2 from file: 144)

12671829 PASCAL No.: 96-0371906

Twenty-GHz broadband microstrip array with electromagnetically coupled high T SUB c superconducting feed network

HERD J S; POLES L D; KENNEY J P; DEROV J S; CHAMPION M H; SILVA J H; DAVIDOVITZ M; HERD K G; BOCCHI W J; MITTLEMAN S D; HAYES D T
Rome Lab, Hanscom MA, United States

Journal: IEEE Transactions on Microwave Theory and Techniques, 1996, 44 (7 2) 1384-1389
ISSN: 0018-9480 CODEN: IETMAB Availability: INIST-222 G2
No. of Refs.: 26 Refs.
Document Type: P (Serial) ; A (Analytic)
Country of Publication: United States
Language: English

The use of high-temperature superconducting (HTS) feed lines and phase shifters can substantially improve the performance of microwave and millimeter-wave printed **phased array antennas** . A novel **antenna** architecture is described that provides a broadband radiating aperture to be used as a scanning array with compatible low-loss HTS phase shifters. The approach follows an earlier design demonstrated at 12 GHz, and this work extends the approach to 20 GHz. The antenna design, radiation patterns, bandwidth measurements, and thermal analysis are reported. A prototype thermal isolator design is described that reduces the heat load of coaxial interconnections between cryocooled and room temperature systems.

English Descriptors: Broadband microstrip array; Feed network; Antenna architecture; Broadband radiating aperture; Scanning array; Antenna design; Bandwidth measurements; Coaxial interconnections; Theory; Microstrip antennas; Broadband networks; High temperature superconductors ; Phase shifters; Performance; Microwave antennas; Millimeter wave devices; Directional patterns (antenna); Bandwidth; Thermoanalysis; Thermal load; Product design; Antenna phased arrays; Experiments

French Descriptors: Theorie; Antenne microruban; Reseau large bande; Supraconducteur haute temperature; Dephaseur; Performance; Antenne hyperfrequence; Dispositif onde millimetrique; Diagramme directivite; Largeur bande; Analyse thermique; Charge thermique; Conception produit; Antenne reseau equiphase; Experience

Classification Codes: 001D04B; 001D05C; 001D03G02A; 001D03F; 001D06D02A;
230

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Set     Items   Description
S1      19980   E3,E10,R20,E12
S2       9485   'ANTENNA PHASED ARRAY':'ANTENNA PHASED ARRAYS RADIATORS'
S3      23661   S2 OR S1
S4      43107   'TEMPERATURE CONTROL'  (January 1969)
S5      81936   'TEMPERATURE DISTRIBUTION'  (January 1969)
S6      80367   'THERMAL CONDUCTIVITY'  (January 1969)
S7       6744   E4,E6,E7
S8     206347   S4:S7
S9         47   S8 AND S3
S10        43   RD (unique items)
S11         0   S10 AND TURBULEN?
S12    712920   (TEMPERATURE? ? OR THERMAL)(2N)(CONTROL? OR MAINTAIN? OR P-
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             MEASUREMENT OR MEASUREMENTS)
S13    273999   ANTENNA?
S14   2173579   PROTUSION? ? OR PROTRUDE? ? OR EXTRUDE? ? OR EXTRUSION? ? -
             OR BUMP? ? OR DIMPLE? ? OR PROJECT OR PROJECTS OR PROJECTION?
             ? OR NODE? ? OR NODULE? ? OR BUMP? ? OR FIN OR FINS
S15      1817   S12(S)S13
S16        89   S15(S)(PHASED()ARRAY? ?)
S17        53   RD (unique items)
S18        48   S17 NOT PY>2000
S19        47   S18 NOT PD>20000913
S20        65   S15(10N)(PHASED()ARRAY? ?)
S21        38   RD (unique items)
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S24        53   S22
S25        32   RD (unique items)
S26        30   S25 NOT (PY>2000 OR PD>20000913)
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Set     Items   Description
S1     150767   ISOTHERMAL
S2     257862   ANTENNA?
S3      26062   PHASED()ARRAY? ?
S4          2   S1(S)S2(S)S3
S5          1   RD (unique items)
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